

Overview

For FY 2012, the NASA Office of Inspector General (OIG) requests \$37.5 million. This request will support the work of 206 auditors, investigators, analysts, specialists, and support staff located at NASA Headquarters in Washington, D.C., and 12 other locations throughout the United States.

The OIG conducts audits, reviews, and investigations of NASA programs to prevent and detect fraud, waste, abuse, and mismanagement and to assist NASA management in promoting economy, efficiency, and effectiveness. The OIG's Office of Audits (OA) conducts independent and objective audits of NASA programs, projects, operations, and contractor activities. In addition, OA oversees the work of the independent public accounting firm that conducts the annual audit of NASA's financial statements. In its work, OA targets high-risk areas and management challenges, responds to NASA's changing needs and priorities, and provides measurable results that contribute to NASA's success in achieving its mission of pioneering the future of space exploration, scientific discovery, and aeronautics research.

Going forward, OA intends to focus its work in the areas identified by the OIG in November 2010 as the Agency's top management and performance challenges:

- Future of U.S. Space Flight
- Acquisition and Project Management
- Infrastructure and Facilities Management
- Human Capital
- Information Technology Security
- Financial Management

In this regard, ongoing audits are examining the status of NASA's safety and human rating efforts for the commercial space flight industry, whether NASA's grant funds are being used for intended purposes, NASA's tuition reimbursement program, and whether NASA is effectively managing its Mars Science Laboratory Project to accomplish its exploration objectives while meeting revised milestones and controlling costs.

The Office of Investigations (OI) investigates allegations of cybercrime, fraud, waste, abuse, and misconduct that may affect NASA programs, projects, operations, and resources. OI refers its findings to the Department of Justice for criminal prosecution and civil litigation or to NASA management for administrative action. Through its investigations, OI develops recommendations for NASA management to reduce the Agency's vulnerability to criminal activity.

Given the inherent risk associated with space operations and aeronautics and that NASA spends approximately 85 percent of its budget on contracts and grants, OI targets its resources to maintain the integrity of NASA's procurement process and on issues relating to the safety of NASA's missions and information systems. In the procurement area, OI's caseload includes investigations of allegations of false claims submitted by NASA contractors, conflict of interest cases involving NASA employees who place private gain before public service, and Procurement Integrity Act violations.

Finally, through its investigations, the Office of Investigations seeks to prevent and deter misconduct at NASA through an aggressive "lessons learned" approach with NASA management. To this end, the OIG works with NASA officials to shore up vulnerabilities that may have allowed crimes or misconduct to occur within their programs and operations.

NASA Office of Inspector General FY 2012 Budget Request Summary

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	Auth Act FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>36.4</u>	<u>36.4</u>	<u>37.0</u>	<u>37.5</u>	<u>37.5</u>	<u>37.5</u>	<u>37.5</u>	<u>37.5</u>
Inspector General	36.4	-	-	37.5	37.5	37.5	37.5	37.5

NASA OIG submitted an original request of \$40.8 million that included an over guide of \$3.0 million.

In accordance with Public Law 110-409, Inspector General Reform Act of 2008, the Inspector General certifies that the \$0.4 million for staff training in the budget request satisfies all known training requirements. We have no known funding requirement to support the Council of Inspectors General on Integrity and Efficiency for this budget request.

Plans for FY 2012

Inspector General

- Major Changes: None

Major Highlights for FY 2012

OIG's FY 2012 request is broken out as follows:

- \$31.4 million (83.8 percent) of the proposed budget is dedicated to personnel and related costs. Salaries include the required additional 25 percent law enforcement availability pay for criminal investigators.
- \$1.2 million (3.2 percent) of the proposed budget is dedicated to travel, per diem at current rates, and related expenses.
- \$1.75 million (4.5 percent) of the proposed budget is dedicated to operational expenses and includes funding for training, government vehicles, special equipment for criminal investigators, employee transportation subsidies, and information technology equipment unique to the OIG.
- \$3.2 million (8.5 percent) of the proposed budget funds the Agency's annual financial audit.

The Consolidated Appropriations Act, 2010 (P.L. 111-117) funded NASA OIG at the President's Budget level, but changed funding availability from two years to one year. In FY 2012, the OIG requests a return to two-year funding to more efficiently plan for, execute, and control its budget.

The FY 2012 budget estimate for the OIG totals \$37.5 million:

- Personnel and related costs \$31.4 million
- Travel \$1.2 million
- Operations and Equipment \$4.9 million

Performance Achievement Highlights

In 2010, OA issued 32 audit reports, including reports assessing how well NASA had managed its Tracking and Data Relay Satellite System Program to accomplish its technical objectives while meeting established milestones and controlling costs, NASA's implementation of recommendations to improve the medical and behavioral health care provided to the Astronaut Corps, and the performance of the private company NASA hired to provide reduced gravity flights for NASA research, engineering, and astronaut training. Other reports uncovered weaknesses in NASA's disposition of information technology equipment related to the Space Shuttle Program and in NASA's information technology security. In addition, after receiving disclaimers of opinion on its financial statements during the previous seven years, NASA received a qualified opinion on its FY 2010 financial statements. Over the past several years, NASA financial managers - working with the OIG and the independent accounting firm whose work the OIG oversees - made steady progress resolving previously identified weaknesses and their efforts resulted in the qualified opinion.

In 2010, OI investigated and issued reports on two high-profile matters involving senior NASA managers. In the first of these matters, the OI reviewed NASA's decision to remove the manager of NASA's Constellation Program. The OIG found that the reassignment was a management decision made by the Associate Administrator for Exploration Systems with the concurrence of the NASA Administrator, and was taken in response to actions by the manager that led senior NASA leadership to believe he could no longer effectively lead the Constellation Program during a period when the President was seeking to cancel the Program in the face of significant congressional opposition.

In the other matter, OI investigated allegations that NASA Administrator Charles F. Bolden, Jr. inappropriately consulted with Marathon Oil Corporation as he considered NASA's involvement in an alternative fuel project. Bolden had served on Marathon's Board of Directors for six years prior to becoming Administrator and held more than \$500,000 in Marathon stock when he contacted the company seeking information about the project. The OIG concluded that Bolden's contact with Marathon did not violate federal laws or ethics regulations pertaining to conflicts of interest but was not consistent with the ethics pledge he signed upon taking office.

In the OIG's most recent semi-annual reporting period, OI investigations resulted in recoveries of more than \$27.4 million through criminal, civil and administrative fines, restitution and other recoveries. Of this amount, \$11.7 million was returned directly to NASA.

In the safety area, a recent OIG investigation resulted in the conviction of a Space Shuttle parts supplier who attempted to substitute non-conforming parts into Space Shuttle Discovery's payload bay. According to experts, an in-flight failure of this non-conforming part would have significantly endangered the crew. In addition, OI has pursued and successfully convicted in both domestic and foreign forums individuals who have illegally intruded ("hacked") into NASA's information systems. Many of these investigations are international in scope and involve suspects in Russia, China, Africa, Spain, Romania, Sweden, Portugal, and Italy. The schemes typically involve attempts to infiltrate NASA's systems to commit criminal acts, ranging from pure hacking to attempts to obtain NASA program data and technology.

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FUNDS DISTRIBUTION BY INSTALLATION

(\$ in Millions)	FY 2012
<u>Ames Research Center</u>	<u>\$754.6</u>
Science	\$193.5
Aeronautics Research	\$134.1
Space Technology	\$105.0
Exploration	\$55.2
Space Operations	\$11.4
Education	\$4.8
Cross-Agency Support	\$211.8
Construction & Envrmtl Compl Restoration	\$38.7
<u>Dryden Flight Research Center</u>	<u>\$283.8</u>
Science	\$69.5
Aeronautics Research	\$72.3
Space Technology	\$29.7
Exploration	\$3.3
Space Operations	\$0.4
Education	\$10.5
Cross-Agency Support	\$76.0
Construction & Envrmtl Compl Restoration	\$22.2
<u>Glenn Research Center</u>	<u>\$809.2</u>
Science	\$31.7
Aeronautics Research	\$144.3
Space Technology	\$215.8
Exploration	\$99.7
Space Operations	\$46.8
Education	\$12.2
Cross-Agency Support	\$229.6
Construction & Envrmtl Compl Restoration	\$29.1
<u>Goddard Space Flight Center</u>	<u>\$2,819.0</u>
Science	\$2,100.9
Aeronautics Research	\$0.0
Space Technology	\$55.8
Exploration	\$3.1
Space Operations	\$128.2
Education	\$2.4
Cross-Agency Support	\$468.4
Construction & Envrmtl Compl Restoration	\$60.1
<u>Jet Propulsion Laboratory</u>	<u>\$1,194.6</u>
Science	\$859.0
Aeronautics Research	\$0.0
Space Technology	\$93.4
Exploration	\$4.3
Space Operations	\$166.4
Education	\$1.5
Cross-Agency Support	\$17.2
Construction & Envrmtl Compl Restoration	\$52.9

FUNDS DISTRIBUTION BY INSTALLATION (CONTINUED)

(\$ in Millions)	FY 2012
<u>Johnson Space Center</u>	<u>\$4,987.5</u>
Science	\$25.1
Aeronautics Research	\$0.0
Space Technology	\$53.6
Exploration	\$1,119.1
Space Operations	\$3,268.3
Education	\$8.9
Cross-Agency Support	\$471.8
Construction & Envrmtl Compl Restoration	\$40.6
<u>Kennedy Space Center</u>	<u>\$2,053.3</u>
Science	\$280.6
Aeronautics Research	\$0.0
Space Technology	\$28.7
Exploration	\$931.0
Space Operations	\$352.0
Education	\$4.0
Cross-Agency Support	\$409.9
Construction & Envrmtl Compl Restoration	\$47.1
<u>Langley Research Center</u>	<u>\$927.3</u>
Science	\$94.2
Aeronautics Research	\$180.9
Space Technology	\$242.1
Exploration	\$39.1
Space Operations	\$0.1
Education	\$10.9
Cross-Agency Support	\$319.1
Construction & Envrmtl Compl Restoration	\$40.8
<u>Marshall Space Flight Center</u>	<u>\$2,556.8</u>
Science	\$130.6
Aeronautics Research	\$0.0
Space Technology	\$163.8
Exploration	\$1,524.7
Space Operations	\$199.5
Education	\$5.2
Cross-Agency Support	\$472.7
Construction & Envrmtl Compl Restoration	\$60.3

FUNDS DISTRIBUTION BY INSTALLATION (CONTINUED)

(\$ in Millions)	FY 2012
<u>NASA Headquarters and IG</u>	<u>\$2,112.1</u>
Science	\$1,229.7
Aeronautics Research	\$37.8
Space Technology	\$25.8
Exploration	\$80.9
Space Operations	\$141.6
Education	\$77.2
Cross-Agency Support	\$456.5
Construction & Envrmtl Compl Restoration	\$25.1
Inspector General	\$37.5
<u>Stennis Space Center</u>	<u>\$226.0</u>
Science	\$2.1
Aeronautics Research	\$0.0
Space Technology	\$10.4
Exploration	\$88.1
Space Operations	\$32.2
Education	\$0.7
Cross-Agency Support	\$59.1
Construction & Envrmtl Compl Restoration	\$33.5
Total	\$18,724.3

Note: Totals may not add due to rounding

Supporting Data: Civil Service Full-Time Equivalent (FTE) Distribution by Center

CIVIL SERVICE FULL TIME EQUIVALENT DISTRIBUTION BY CENTER

The workforce level proposed in the budget supports NASA's traditional investments in space exploration, aeronautics research, space technology development, science investigation, and sharing the results of Agency activities with the public and educators.

The Agency will apply its capabilities to the range of mission, research, and technology work while continuing to reshape and realign workforce skills to adjust to changing requirements. NASA anticipates offering buyouts in selected surplus skill areas, and is prepared to identify, recruit and retain employees who possess essential/critical skills and competencies. The workforce will continue to demonstrate the relevance of its work to society, apply itself to contemporary problems, lead or participate in emerging technology opportunities, and communicate the challenges and results of Agency programs and activities.

Average Agency full-time equivalent (FTE) levels are expected to decline by approximately 500 FTE over the period FY 2011 through FY 2016, stabilizing at just over 18,000 FTE. This ceiling decline addresses workforce at several Centers affected by changes in the human space flight portfolio, and it reflects the planned end of a temporary FTE increase in FY 2010 – FY 2011 that was granted to encourage early career hiring at Centers.

	Actuals ¹	FTE Estimates ²					
	FY10	FY11	FY12	FY13	FY14	FY15	FY16
ARC	1,241	1,243	1,231	1,231	1,231	1,231	1,231
DFRC	552	559	555	551	551	551	551
GRC	1,629	1,662	1,652	1,642	1,634	1,634	1,634
GSFC	3,223	3,413	3,393	3,373	3,353	3,353	3,353
JSC	3,326	3,314	3,225	3,185	3,185	3,185	3,185
KSC	2,180	2,161	2,095	2,064	2,064	2,064	2,064
LaRC	1,921	1,946	1,927	1,927	1,927	1,927	1,927
MSFC	2,560	2,549	2,490	2,462	2,462	2,462	2,462
SSC	272	298	294	294	294	294	294
HQ	1,206	1,238	1,208	1,188	1,188	1,188	1,188
NSSC	<u>130</u>	<u>146</u>	<u>146</u>	<u>146</u>	<u>146</u>	<u>146</u>	<u>146</u>
TOTAL	18,240	18,529	18,216	18,063	18,035	18,035	18,035
OIG	194	213	213	213	213	213	213

¹ Includes 307 student FTE

² Includes 285 student FTE each FY

Supporting Data: Budget for FY 2012 by Object Class

BUDGET FOR FY 2012 BY OBJECT CLASS CODE

The following tables reflect projections of obligations for FY 2012 based on prior year actual object class obligation experience.

FY 2012 Total and Mission Directorate Estimates (\$M)	NASA	SCIENCE	AERONAUTICS	SPACE TECHNOLOGY	EXPLORATION SYSTEMS	SPACE OPERATIONS	EDUCATION	CROSS AGENCY SUPPORT	CONSTRUCTION, ENVIRONMENTAL COMPLIANCE, and REMEDIATION
Personnel compensation									
Full-time permanent	\$1,916	\$216	141	\$95	\$242	\$252	\$6	\$964	\$0
Other than full-time permanent	\$144	\$24	\$15	\$9	\$24	\$18	\$0	\$54	\$0
Other personnel compensation	\$52	\$1	\$1	\$1	\$2	\$2	\$0	\$45	\$0
Special personal service payments	\$1	\$0	\$0	\$0	\$0	\$0	\$0	\$1	\$0
Total Personnel compensation	\$2113	\$241	\$157	\$105	\$268	\$272	\$6	\$1064	\$0
Civilian personnel benefits	\$542	\$63	\$40	\$28	\$72	\$71	\$2	\$266	\$0
Benefits to former personnel	\$3	\$0	\$0	\$0	\$0	\$0	\$0	\$3	\$0
Travel & transportation of persons	\$77	\$13	\$6	\$1	\$15	\$11	\$0	\$31	\$0
Transportation of things	\$1145	\$2	\$0	\$0	\$1	\$1139	\$0	\$3	\$0
Rental payments to GSA	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$19	\$0
Rental payments to others	\$10	\$7	\$0	\$0	\$0	\$1	\$0	\$2	\$0
Communications, utilities & misc charges	\$90	\$4	\$2	\$2	\$8	\$17	\$0	\$57	\$0
Printing and reproduction	\$7	\$1	\$0	\$0	\$0	\$1	\$0	\$5	\$0
Advisory and assistance services	\$802	\$143	\$12	\$65	\$255	\$82	\$4	\$184	\$57
Other services	\$783	\$297	\$22	\$15	\$58	\$75	\$4	\$303	\$9
Other purchases of goods & services from Gov accounts	\$311	\$118	\$5	\$15	\$59	\$49	\$0	\$59	\$6
Operation and maintenance of facilities	\$1627	\$45	40	\$49	\$204	\$925	\$2	\$273	\$89
Research & development contracts	\$8838	\$3329	\$201	\$669	\$2789	\$1488	\$7	\$311	\$44
Medical care	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$5	\$0
Operation and maintenance of equipment	\$750	\$71	\$11	\$20	\$79	\$196	\$3	\$365	\$5
Supplies and materials	\$137	\$22	\$31	\$5	\$18	\$27	\$1	\$26	\$7
Equipment	\$187	\$72	\$19	\$5	\$21	\$11	\$0	\$59	\$0
Land and structures	\$349	\$12	\$3	\$3	\$10	\$15	\$0	\$74	\$232
Grants, subsidies, and contributions	\$891	\$566	\$19	\$22	\$88	\$3	\$110	\$83	\$0
TOTAL DIRECT	\$18,686	\$5006	\$568	\$1004	\$3945	\$4383	\$139	\$3192	\$449

Note: 90 percent of the FY 2012 Office of the Inspector General (OIG) Budget will be obligated in the personnel compensation object class

Supporting Data: Status of Unobligated Funds

STATUS OF UNOBLIGATED FUNDS

The figures below represent actual unobligated balances within NASA's individual appropriation accounts as of September 30, 2010, and estimates for the disposition of those accounts at the future dates specified.

FY 2009 – FY 2012 Appropriations (\$ in millions)	Unobligated Balances Sept. 30, 2010	Estimated Unobligated Balances Sept. 30, 2011	Estimated Unobligated Balances Sept. 30, 2012
Science	59	89	100
Aeronautics	34	10	12
Space Technology			21
Exploration	144	75	78
Space Operations	103	123	87
Education	6	4	3
Cross-Agency Support	15		
Construction and Environmental Compliance and Restoration	84	111	112
Science, Exploration, & Aeronautics*	5		
Inspector General	2	1	1
Total NASA	452	413	414

Supporting Data: Reimbursable Estimates

REIMBURSABLE ESTIMATES

Reimbursable agreements are agreements for which the NASA costs associated with the undertaking are borne by the non-NASA partner. NASA undertakes reimbursable agreements when it has equipment, facilities, and services that it can make available to others in a manner that does not interfere with NASA mission requirements. As most reimbursable requests to NASA do not occur until the year of execution, the FY 2011-2012 estimates are based on an annual survey of Centers' anticipated reimbursable agreements.

Budget Authority (\$ in millions)	FY 2010	Ann. CR FY 2011 ¹	FY 2012 Estimate
Cross Agency Support	1,207.8	3,171.7	2,600.0
Office of Inspector General	0.8	1.3	1.3
Total	1,208.6	3,173.0	2,601.3

Note:

¹The FY 2011 appropriation for NASA was not enacted at the time the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111–242, as amended). The amounts included for FY 2011 reflect the annualized level provided by the Continuing Resolution.

Supporting Data: Enhanced Use Leasing

ENHANCED USE LEASING

In 2003, NASA was authorized by Congress to demonstrate the feasibility of enhanced leasing authority (EUL) and collections at Ames Research Center (ARC) and Kennedy Space Center (KSC). In 2007 and in 2008, Congress amended the authority so that NASA may enter into EUL arrangements at all Centers after December 2008. After deducting the costs of administering the leases, Centers are then permitted to retain 65 percent of net receipt revenue, and the balance is made available for use Agency-wide. These funds are in addition to annual appropriations and no FTEs are funded from EUL income. To support full annual oversight and review, the 2010 Consolidated Appropriations Act (P.L. 111-117) contains a provision that requires NASA to submit in the annual budget justification an estimate of gross receipts, collections, and proposed use of all funds collected. The table below depicts the estimated FY 2012 EUL expenses and revenues. The amounts identified under Capital Asset Account Expenditures may be adjusted between projects listed, based on actual contract award.

FY2012 EUL Expenses and Revenues (\$K)	ARC	KSC	Agency	Total
Base Rent	4,988.6	41.4		5,030.0
Institutional Support Income	1,832.9	15.0		1,847.9
Total Rent Income	6,821.5	56.4		6,877.9
Institutional Support Costs	(1,832.9)	\$ (15.0)		(1,847.9)
Lease Management and Administration	(742.0)	-		(742.0)
Tenant Building Maintenance and Repair	(340.0)	-		(340.0)
Total Cost Associated with Leases	(2,914.9)	(15.0)		(2,929.9)
Net Revenue from Lease Activity	3,906.6	41.4		3,948.0
Beginning Balance, Capital Asset Account	246.7	11.8		258.5
Net Revenue from Lease Activity	2,539.3	26.9	1,381.8	3,948.0
- Planned Maintenance Various Buildings (ARC)	1,656.0			1,656.0
- Replace Roofs, Various Buildings (ARC)	883.3			883.3
- Install Fire Alarm Devices for Cafeteria Area, M7-0355 (KSC)		38.7		38.7
- Energy & Sustainability Upgrades, Various Buildings (Various Centers)			1,381.8	1,381.8
Center Capital Asset Account Expenditures	2,539.3	38.7	1,381.8	3,959.8
Capital Asset Account Ending Balance	246.7	0.0	0.0	246.7
Additional Reimbursable Demand Services Requested by Lessees (including overhead)	776.3			776.3
Cost to Fulfill Reimbursable Demand Services (including overhead)	(776.3)			(776.3)
Net activity due to Reimbursable Demand Services	-	-		-
In Kind	425.0	-		425.0

Definitions:

Base Rent - Revenue collected from tenant for rent of land or buildings.

Institutional Support Costs - Cost for institutional shared services such as fire, security, first responder, communications, common grounds, road, and infrastructure maintenance, and routine administrative support and management oversight (i.e., environmental).

Total Rental Income - Total gross proceeds from EUL activities for expenses due to renting NASA property.

In-Kind - Consideration accepted in lieu of rent payment. (Only applies to selected leases signed

Supporting Data: Enhanced Use Leasing

prior to January 1, 2009).

Reimbursable Demand Services - Services such as janitorial, communications, and maintenance that solely benefit the tenant and provided for their convenience. There is no net income received by NASA, as these payments may only cover the costs of NASA and its vendors providing these services.

Overhead - General and administrative costs associated with management of the specified demand services.

Supporting Data: Budget for Microgravity Science

BUDGET FOR INTERNATIONAL SPACE STATION RESEARCH

The Exploration Systems Mission Directorate (ESMD) and Space Operations Mission Directorate (SOMD) support research to take advantage of the unique environment of reduced gravity on International Space Station (ISS) in two broad categories – Exploration ISS Research and Non-Exploration ISS Research.

\$ in millions	Ann. CR						
	FY 2010	FY 2011 ¹	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Exploration ISS Research	\$183	\$150	\$151	\$144	\$143	\$140	\$143
Non- Exploration ISS Research	\$83	\$74	\$69	\$69	\$72	\$79	\$79
Total	\$266	\$224	\$220	\$213	\$215	\$219	\$223
% of Non-Exploration to Total	31%	33%	31%	32%	33%	36%	36%

Note:

¹The FY 2011 appropriation for NASA was not enacted at the time the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111–242, as amended). The amounts included for FY 2011 reflect the annualized level provided by the Continuing Resolution.

Non-Profit Organization

Having launched the U.S. and international partner elements, and established six-person crew capability, the ISS program focus is now primarily on research. During FY 2011, NASA will be awarding a cooperative agreement to an independent non-profit organization (NPO) with responsibility to further develop national uses of the ISS. The NPO will oversee all research involving organizations other than NASA, and transfer current NASA biological and physical research to the NPO in future years. Space Operations oversight of existing research projects will be phased out and NPO will co-select/manage new peer-reviewed projects. As on-going work within the NASA research project offices is completed in future years, extension/renewal decisions should be made by the NPO.

Through the management partnership, research opportunities will be expanded to conduct research in life sciences, material sciences, biotechnologies, condensed matter physics and thermal sciences (e.g., fluid mechanics, thermodynamics, heat transfer and combustion). NASA will continue to support research to meet NASA requirements for exploration including astronaut health and serve as a test bed for the development and demonstration of technology for future space exploration missions.

Exploration ISS Research

Exploration ISS Research supports the Agency's need for improved knowledge about working and living in space to enable future long-duration human exploration missions.

The Human Research Program will provide research results that reduce risks to crew health and performance that stem from prolonged exposure to reduced gravity, space radiation, and isolation during exploration missions. Risk mitigation will be achieved by conducting ISS research in human health countermeasures, space human factors and habitability, behavioral health and performance, and exploration medicine, tools, and technologies.

ISS Research will investigate the underlying gravity-dependent phenomena in the following areas: fire prevention, detection, and suppression; boiling; multiphase flow of fluids; and capillary driven flow. These applied research investigations will provide needed data that is useful in the future design of the following space technology areas: life support systems; propellant storage; power generation; thermal

Supporting Data: Budget for Microgravity Science

control; and advanced environmental monitoring and control. Funding for the Multi-User System Support (MUSS), which supports Exploration ISS Research, is included in the table above. The MUSS function is responsible for all payload physical, analytical and operations integration activities; projecting available utilization resources and accommodations; tactical planning; and execution of the day-to-day ISS integrated research plan for all payloads, including NASA, international partners, and non-NASA users.

Non-Exploration ISS Research

NASA allocates at least 15 percent of the funds budgeted for ISS research to ground-based, free-flyer, and ISS life and physical science research that is not directly related to supporting the human space exploration program, in accordance with Section 204 of the NASA Authorization Act of 2005. The purpose is to ensure the capacity to support ground-based research leading to space-based basic and applied scientific research in a variety of disciplines with potential direct national benefits and applications that can be advanced significantly from the uniqueness of microgravity and the space environment. Additionally, this allocation allows basic ISS research in fields including, physiological research, basic fluid physics, combustion science, cellular biotechnology, low-temperature physics, cellular research, materials science, and plant research to be carried out to the maximum extent practicable. This research helps to sustain existing U.S. scientific expertise and capability in microgravity research. The Non-Exploration ISS Research line the above table also includes the Alpha Magnetic Spectrometer (AMS), and costs for MUSS support. The AMS is a particle physics and astrophysics experiment, planned for the ISS, which will look for dark matter, anti-matter, and strange matter.

Supporting Data: Budget for Safety Oversight

BUDGET FOR SAFETY OVERSIGHT

The following table provides the Safety and Mission Assurance (S&MA) budget estimates. This includes the Agency-wide safety oversight functions and estimates for project specific safety, reliability, maintainability and quality assurance elements embedded within individual projects.

BUDGET SUMMARY FOR SAFETY OVERSIGHT

\$ in Millions	FY 2010	Ann. CR FY 2011 ¹	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
<u>Total Safety</u>	<u>452.0</u>	<u>432.4</u>	<u>442.2</u>	<u>448.9</u>	<u>461.1</u>	<u>470.2</u>	<u>479.5</u>
<u>Agency-wide Safety Oversight</u>	<u>133.7</u>	<u>139.9</u>	<u>142.9</u>	<u>146.7</u>	<u>150.9</u>	<u>155.4</u>	<u>159.7</u>
Safety and Mission Assurance	51.3	49.0	49.5	49.9	50.5	51.2	51.8
Institutional Operational Safety	30.8	38.9	39.7	40.7	42.0	43.3	44.5
Technical Authority/S&MA Sup.	51.6	52.0	53.7	56.1	58.4	60.9	63.4
<u>Program Specific</u>	<u>318.3</u>	<u>292.5</u>	<u>299.3</u>	<u>302.2</u>	<u>310.2</u>	<u>314.8</u>	<u>319.8</u>
Science	70.3	74.4	77.5	81.0	83.5	84.7	86.1
Aeronautics	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Space Technology	0.0	12.8	21.5	22.0	21.8	25.6	26.0
Exploration	94.1	92.0	102.7	103.4	106.8	112.3	114.0
Space Operations	153.8	113.2	97.5	95.7	98.0	92.1	93.6

Note:

¹The FY 2011 appropriation for NASA was not enacted at the time the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111–242, as amended). The amounts included for FY 2011 reflect the annualized level provided by the Continuing Resolution.

Definitions:

Agency-Wide Safety Oversight - Agency level programs and activities that support the overarching NASA Safety and Mission Success program.

Safety and Mission Assurance - The Safety and Mission Assurance program administers and refines policies, procedural requirements, and technical safety standards. The program participate in forums that provide advice to the Administrator, Mission Directorates, Center Directors, and program managers who are ultimately accountable for the safety and mission success of all NASA programs, projects, and operations. Specific program responsibility include, among other activities, managing NASA's Orbital Debris program, NASA's Electronic Parts program, and the NASA Safety Center.

Institutional Operational Safety - NASA's institutional operational safety program is driven by guidance from the Occupational and Safety and Health Administration (OSHA) and NASA Procedural Requirements (NPR). Guidance includes OSHA Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters (OSHA 29 CFR 1960), NASA Safety and Health Handbook Occupational Safety and Health Programs (NPR 8715.1), and NASA's general safety program requirements (NPR 8715.3). The program includes multiple safety, training, awareness, prevention, and reporting initiatives, all in accordance with the regulations listed above. The

Supporting Data: Budget for Safety Oversight

institutional operational safety program requires significant coordination at the federal, state, and local levels.

S&MA Technical Authority and S&MA Support - The S&MA Technical Authority program includes travel and labor only for all S&MA supervisors, branch chiefs or above, and designated deputies. In addition, where the principal job function of a non-supervisory S&MA person consists of rendering authoritative decisions on S&MA requirements (i.e., matters relating to the design or operation of a program or project), that person's salary is included. These positions often are the lead S&MA manager positions for large programs where the decision making process is nearly a full-time demand. This category does not include salary for those whose work only occasionally falls as an authority task, but does include travel funds in direct support of these individuals when they conduct S&MA activities.

S&MA is mission support, including administrative support, which cannot be directly charged to a program. This budget includes: policy development across the programs; range safety; payload safety (ground processing); independent assessments; metrology and calibration; reliability and maintainability policy; Center-wide S&MA program integration and analysis; business and administrative support to S&MA directorates; and quality assurance for facilities and ground support hardware.

Program Specific - Project specific S&MA costs are included in individual project budgets. These costs include the technical and management efforts of directing and controlling the S&MA elements of the project. This incorporates the design, development, review, and verification of practices and procedures and mission success criteria intended to assure that the delivered spacecraft, ground systems, mission operations, and payload(s) meet performance requirements and function for their intended lifetimes. This element excludes mission and product assurance efforts directed at partners and subcontractors (other than S&MA review/oversight), and the direct costs of environmental testing.

Supporting Data: Budget for Public Relations

BUDGET FOR PUBLIC RELATIONS BY CENTER

The NASA budget for Public Affairs is funded within Cross-Agency Support under: Center Management and Operations and Agency Management and Operations. All the installations listed below, except for Headquarters, are in the Center Management and Operations account. The Headquarters budget is in the Agency Management and Operations account.

These budgets include dissemination of information about NASA programs to the news media and the general public. Content includes support for public affairs/public relations, Center newsletters, internal communications, guest operations (including bus transportation), public inquiries, NASA TV, the NASA Web site, and other multimedia support.

Public Affairs funding by installation is shown below.

Center (\$ in millions)	FY 2010	Ann. CR FY 2011 ¹	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Ames Research Center	1.7	1.8	1.8	1.9	2.0	2.1	2.1
Dryden Flight Research Center	0.7	0.8	0.8	0.8	0.9	0.9	0.9
Glenn Research Center	3.0	2.9	3.0	3.1	3.2	3.4	3.5
Goddard Space Flight Center	4.4	4.8	5.0	5.2	5.4	5.7	6.0
Headquarters	13.6	14.4	13.5	14.4	14.7	15.1	15.5
Johnson Space Center	4.1	4.0	4.0	3.9	3.9	3.9	3.9
Kennedy Space Center	6.0	6.6	6.5	6.8	6.7	6.9	7.3
Langley Research Center	2.1	2.2	2.3	2.4	2.4	2.5	2.6
Marshall Space Flight Center	5.4	5.5	5.5	5.6	5.8	5.9	6.1
Stennis Space Center	2.1	2.1	1.9	1.9	2.0	2.0	2.1
Total	43.1	45.1	44.3	46.0	47.0	48.4	50.0

Note:

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SUMMARY OF CONSULTING SERVICES

NASA uses paid experts and consultants to provide advice and expertise beyond that which is available from its in-house civil service workforce. Management controls ensure that there is ample justification for consulting services before these services are obtained. Much of the Agency's expert and consultant support is for the NASA Advisory Council and the Aerospace Safety Advisory Panel. NASA uses experts and consultants to provide expertise on the selection of experiments for future space missions. The use of these experts and consultants provides the Agency with an independent view that assures the selection of experiments likely to have the greatest scientific merit. Other individuals provide independent views of technical and functional problems in order to provide senior management with the widest possible range of information to support making major decisions.

Expert/Consultants (Total NASA)	FY 2010	Ann. CR FY 2011 ¹	FY 2012 Estimate
Number of Paid Experts and Consultants	33	33	33
Annual FTE Usage	5	5	5
Salaries	\$0.3	\$0.3	\$0.3
Total Salary and Benefits Costs	\$0.4	\$0.4	\$0.4
Travel Costs	\$0.3	\$0.3	\$0.3
Total Costs	\$0.7	\$0.7	\$0.7

Note:

¹The FY 2011 appropriation for NASA was not enacted at the time the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111-242, as amended). The amounts included for FY 2011 reflect the annualized level provided by the Continuing Resolution.

Note: Definition of Consultants and Experts

Consultant – A person who can provide valuable and pertinent advice generally drawn from a high degree of broad administrative, professional, or technical knowledge or experience. When an agency requires public advisory participation, a consultant also may be a person who is affected by a particular program and can provide useful views from personal experience.

Expert – A person who is specially qualified by education and experience to perform difficult and challenging tasks in a particular field beyond the usual range of achievement of competent persons in that field. An expert is regarded by other persons in the field as an authority or practitioner of unusual competence and skill in a professional, scientific, technical, or other activity.

These definitions are located under 5 CFR 304.102. The appointments are made under 5 U.S.C. 3109, and the use of this authority is reported to Office of Personnel Management (OPM) annually.

Supporting Data: E-Gov Initiatives and Benefits

E-GOV INITIATIVES AND BENEFITS

NASA is providing funding contributions in FY 2012 for each of the following E-Government initiatives:

Initiative	2012 Contributions (Includes In Kind)	2012 Service Fees
E-Rulemaking 026-00-01-99-04-0060-24		\$42,021
Grants.gov 026-00-01-99-04-0160-24	\$215,549	
E-Training 026-00-01-99-04-1217-24		\$1,500,000
Recruitment One-Stop 026-00-01-99-04-1218-24		\$107,323
Enterprise HR Integration 026-00-01-99-04-1219-24		\$377,229
E-Payroll 026-00-01-99-04-1221-24		\$4,105,200
E-Travel 026-00-01-99-04-0220-24		\$1,236,635
Integrated Acquisition Environment 026-00-01-99-04-0230-24		\$1,721,363
Integrated Acquisition Environment - Loans and Grants 026-00-01-99-04-4300-24		\$68,403
Financial Management Lines of Business 026-00-01-99-04-1100-24	\$75,000	
Human Resources Management Lines of Business 026-00-01-99-04-1200-24	\$65,217	
Grants Management Lines of Business 026-00-01-99-04-1300-24	\$59,316	
Geospatial Lines of Business 026-00-01-99-04-3100-24	\$15,000	
Budget Formulation and Execution Lines of Business 026-00-01-99-04-3200-24	\$105,000	
NASA Total	\$535,082	\$9,089,771

Note: Service fees are estimates as provided by the E-Government initiative managing partners

Supporting Data: E-Gov Initiatives and Benefits

The E-Government initiatives serve citizens, businesses, and Federal employees by delivering high quality services more efficiently and at a lower price. Instead of expensive “stove-piped” operations, agencies work together to develop common solutions that achieve mission requirements at reduced cost, thereby making resources available for higher priority needs. Benefits realized through the use of these initiatives for NASA in FY 2012 include:

E-Rulemaking (Managing Partner EPA) FY 2010 Benefits

NASA’s benefits for the E-Rulemaking initiative are largely focused on public benefits by providing “one-stop” access to NASA and other Federal agency information on rulemakings and non-rulemaking through the Regulations.gov Web site.

In addition to the process benefits the E-Rulemaking solution offers, it is estimated to provide cost avoidance benefits over traditional baseline paper processes to a level of \$30 million over five years. The electronic docket solution selected by E-Rulemaking governance bodies is a centralized architecture that is configurable for each participating entity allowing role-based access to develop workflow and collaboration processes to manage their content. This centrally managed solution is estimated to save a range of \$106 – \$129 million over five years as compared to other alternatives that seek the same benefits but are based on decentralized architectures. These figures were calculated in the summer of 2007 by an independent economist hired by the E-Rulemaking Program to develop a cost-benefit model.

NASA benefits in several ways through its participation and reliance on Federal Docket Management System (FDMS) and Regulations.gov. NASA improves the transparency of its rulemaking actions and increases public participation in the regulatory process. Direct budget cost savings and cost avoidance result from NASA’s transition to FDMS and Regulations.gov, enabling the Agency to discontinue efforts to develop, deploy, and operate specific individual online docket and public comment systems. Over a five-year period, NASA is estimated to save over \$700 thousand over alternative options that would provide similar services.

Grants.gov (Managing Partner HHS) FY 2012 Benefits

The Grants.gov initiative benefits NASA and its grant programs by providing a single location to publish grant (i.e., funding) opportunities and application packages, making the process easier for applicants to apply to multiple agencies. In FY 2010, all 26 major Federal grant making agencies posted their synopses for discretionary funding opportunity announcements on Grants.gov.

The Grants.gov initiative benefits NASA and its grant programs by providing broader exposure to a wider community that could potentially apply for NASA funding and bring in new ideas, innovations, and solutions. In addition, Grants.gov provides a single site for the grantee community to apply for grants using a standard set of forms, processes, and systems thereby giving them greater access to and ability in applying for Federal funding. Through the use of Grants.gov, NASA is able to reduce operating costs associated with online posting and application of grants. Additionally, the Agency is able to improve operational effectiveness through use of Grants.gov by increasing data accuracy and reducing processing cycle times.

E-Training (Managing Partner OPM) FY 2012 Benefits

The E-Training initiative provides access to premier electronic training systems and tools that support the training and development of the Federal workforce. The initiative advanced the accomplishment of Agency missions through simplified and one-stop access to E-Training products and services. The availability of an electronic training environment enhances the ability of the Federal Government and NASA to attract, retain, manage, and educate the highly skilled professionals needed for a flexible and high-performing government workforce.

Supporting Data: E-Gov Initiatives and Benefits

The E-Training initiative benefits NASA and the Federal workforce by reducing redundancies and achieving economies of scale in the purchase and/or development of E-learning content and in purchase of learning technology infrastructure. In 2006, NASA streamlined its three separate online training systems into one centralized, learning management system, SATERN, a one-stop approach offering Web-based access to training and career development resources. This centralized approach allows NASA to reduce and leverage training costs through the elimination of unique systems and standardization of training processes.

Through SATERN, employees can view required training, launch online content, view training history, and self-register for approved courses and conferences. In addition, the system allows NASA officials to identify groups and individuals who have not met basic training requirements, and ensure accountability for mission critical and federally mandated training and development. SATERN also offers employees access to career planning tools, individual development plans, and competency management assistance. SATERN offers learners access to more than 2,000 online courses and 10,000 online books and training videos. SATERN is available 24/7 and can be accessed from work or home.

Recruitment One-Stop (Managing Partner OPM) FY 2012 Benefits

USAJOBS simplifies the Federal job search process for job seekers and Federal agencies. The USAJOBS.gov Web site provides a single site where citizens can easily search for employment opportunities throughout the Federal Government. USAJOBS is a fully operational, state-of-the-art recruitment system that benefits both job seekers and employing agencies. Through USAJOBS.gov users have access to:

- A centralized repository for all competitive service job vacancies;
- A resume repository used by agencies to identify critical skills;
- A standardized online recruitment tool and associated services;
- A standard application process; and
- Intuitive job searches including e-mail notifications for jobs of interest.

USAJOBS enables NASA to better attract individuals who can help accomplish the Agency's missions. The USAJOBS interface allows job seekers to view and apply for all NASA employment opportunities, as well as those from other Federal agencies. On average, USAJOBS.gov receives over 400,000 visitors per day, supports submission of over 500,000 new resumes monthly, and serviced over 21 million applications during FY 2010.

In 2005, NASA adopted the USAJOBS resume as the basic application document for all NASA hirings (except for Astronaut positions). To date, NASA has not identified any specific savings, either in terms of budgeted savings or cost avoidance. Although the Agency believes that implementation of a recruitment one-stop (ROS) has resulted in significant intangible benefits in terms of providing better vacancy information to applicants, it has not resulted in any specific cost savings to NASA. The intangible benefits ROS provides to NASA and other agencies include:

- Decreasing hiring time for managers;
- Providing an integrated solution to agency applicant assessment systems;
- Providing a cost effective marketing and recruitment tool;
- Realizing cost savings over commercial job posting boards;
- Reducing the delay associated with filling critical agency vacancies; and
- Enhancing competition with the private sector for the best and brightest talent for Federal service.

Enterprise HR Integration (Managing Partner OPM) FY 2012 Benefits

The Enterprise HR Integration (EHRI) program supports the strategic management of human capital by providing Agency customers with access to timely and accurate federal workforce data. EHRI has the

Supporting Data: E-Gov Initiatives and Benefits

following goals: 1) streamline and automate the exchange of Federal employee human resources (HR) information Government-wide; 2) provide comprehensive knowledge management and workforce analysis, forecasting, and reporting across the Executive Branch; 3) maximize cost savings captured through automation; and 4) enhance retirement processing throughout the Executive Branch.

A key initiative of EHRI is the electronic Official Personnel Folder (eOPF), a Web-based application that is capable of storing, processing, and displaying the OPFs of all current, separated, and retired Federal employees. When fully implemented, the eOPF will cover the entire Executive Branch as well as some other Federal and local governments with a total user population of more than 1.9 million. The system will replace the existing manual HR process by automating the Federal Government's HR processes and thereby creating a streamlined Federal HR system for all Federal employees. The initiative is achieving cost savings that are recognized on a per-folder basis. The total cost avoidance per folder is estimated at \$55.56.

Specific EHRI/eOPF benefits to NASA include improved convenience in searching, better security and safety to electronic files, more economical and streamlined business processes, and the ability to have a central repository of OPF records for the Agency. During FY 2010, NASA also deployed the eOPF capability of electronic transfer of eOPFs between agencies. Specific NASA employee benefits include secure online access to OPFs, automatic notification when documents are added, exchange of retirement and HR data across agencies and systems, and the elimination of duplicate and repetitive personnel data in personnel folders. NASA completed its implementation to eOPF in March 2008, and transitioned personnel actions processing to the NASA Shared Service Center (NSSC).

E-Payroll (Managing Partner OPM) FY 2012 Benefits

The E-Payroll initiative standardizes and consolidates Government-wide Federal civilian payroll services and processes by simplifying and standardizing HR/payroll policies and procedures and better integrating payroll, HR, and finance functions. Prior to beginning the initiative, 26 Federal agencies provided payroll services. Four providers were selected to furnish payroll services for the Executive branch. In 2004, the Department of Interior (DOI) began serving as NASA's payroll provider, using their system, the Federal Personnel and Payroll System (FPPS). FPPS processes NASA's HR and payroll transactions and supplies all key delivery aspects of its payroll operation functions. The E-Payroll initiative benefits NASA by permitting the Agency to focus on its mission related activities, rather than on administrative payroll functions. Payroll processing costs are reduced through economies of scale and avoiding the cost of duplicative capital system modernization activities. The initiative also promotes standardization of business processes and practices and unified service delivery.

E-Travel (Managing Partner GSA) FY 2012 Benefits

The E-Gov Travel Service (ETS) is a Government-wide Web-based service that provides standardized travel management practices to consolidate federal travel, minimize cost, and produce superior customer satisfaction. ETS is commercially hosted to minimize technology development costs to the Government and guarantee refreshed functionality for basic travel services included in the master contract. From travel planning and authorization to the review and approval of post-travel reimbursement, this end-to-end service streamlines travel management and will enable the Government to capture real-time visibility into the buying choices of travelers and assist agencies in optimizing their travel budgets while saving taxpayers money.

The benefits of the ETS include:

- Increased cost savings associated with overall reduction in Travel Management Center transaction service fees;
- Improved strategic source pricing through cross-Government purchasing agreements;
- Improved business process functionality as a result of streamlined travel policies and processes;

Supporting Data: E-Gov Initiatives and Benefits

- Enhanced security and privacy controls for the protection of Government and personal data; and
- Improved agency oversight and audit capabilities.

As ETS is a fully integrated, end-to-end travel solution, program cost avoidance is realized by a reduction of traveler and manager time for planning, arranging, authorizing, approving, and post-travel reimbursement processing. Travelers also benefit from increased efficiency in the end-to-end electronic solution as their reimbursements are expedited. Additional initiative savings are realized from the elimination of costly paper-based systems, the decommissioning of legacy travel systems, and the reduction of agency overhead by consolidating the number of travel contracts.

In 2009, NASA completed migration of its travel services to HP Enterprise Services (formerly Electronic Data Systems Corporation), one of the three designated E-Travel service providers. Completing this migration has allowed NASA to provide more efficient and effective travel management services. NASA employees are also benefitting through more efficient travel planning, authorization, and reimbursement processes. Prior to ETS, the estimated overall Government-wide online adoption rate for travel reservations was approximately 6 percent. To date, in agencies using the ETS end-to-end, the online booking engine adoption rate is over 76 percent, resulting in dramatic cost savings as a result of lowering travel agent service fees. During FY 2010 the averaged online adoption rate for NASA was 63 percent.

Integrated Acquisition Environment (Managing Partner GSA) FY 2012 Benefits

The Integrated Acquisition Environment (IAE) initiative is designed to streamline the process of reporting on subcontracting plans and to provide agencies with access to analytical data on subcontracting performance. Use of the IAE common functions and services allows agencies to focus on agency-specific needs such as strategy, operations, and management while leveraging shared services for common functions. Furthermore, use of a Government-wide business focused service environment reduces funding and resources for technical services and support for acquisition systems originally housed by individual agencies.

IAE facilitates and supports cost-effective acquisition of goods and services by agencies. The IAE initiative provides common acquisition functions and shared services that benefit all agencies, such as the maintenance of information about business-partner organizations (e.g., banking, certifications, business types, capabilities, performance). IAE provides benefits to the Government and business-partner organizations by improving cross-agency coordination that helps to improve the Government's buying power, while providing business partners maximum visibility and transparency into the process. IAE provides various services, tools, and capabilities that can be leveraged by the acquisition community including buyers, sellers, and the public to conduct business across the Federal Government space.

Government buyers can:

- Search for commercial and government sources;
- Post synopses and solicitations;
- Securely post sensitive solicitation documents;
- Access reports on vendors' performance;
- Retrieve vendor data validated by Small Business Administration and Internal Revenue Service;
- Identify excluded parties; and
- Report contract awards.

Business suppliers can:

- Search business opportunities by product, service, agency, or location;

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- Receive e-mail notification of solicitations based on specific criteria;
- Register to do business with the Federal Government;
- Enter representations and certifications one time;
- Revalidate registration data annually; and
- Report subcontracting accomplishments.

Citizens can:

- Retrieve data on contract awards;
- Track Federal spending;
- Search to find registered businesses; and
- Monitor business opportunities.

Through adoption of the tools and services provided by IAE, NASA improves its ability to make informed and efficient purchasing decisions and allows it to replace manual processes. If NASA were not allowed to use the IAE systems, the Agency would need to build and maintain separate systems to record vendor and contract information, and to post procurement opportunities. Agency purchasing officials would not have access to databases of important information from other agencies on vendor performance and could not use systems to replace paper-based and labor-intensive work efforts.

Integrated Acquisition Environment – Loans & Grants FY 2012 Benefits

All agencies participating in the posting and/or awarding of contracts, grants and loans are required by the reporting requirements of the Federal Funding Accountability and Transparency Act (FFATA) of 2006 and the American Recovery and Reinvestment Act of 2009 (ARRA) to disclose award information on a publicly accessible Web site. FFATA requires the Office of Management and Budget (OMB) to lead the development of a single, searchable Web site through which the public can readily access information about grants and contracts provided by Federal Government agencies.

Based on the recommendations of the Transparency Act Taskforce, the Web site leverages functionality provided by the IAE initiative to provide Data Universal Numbering System (DUNS) numbers as the unique identifier. An existing IAE Dun and Bradstreet (D&B) transaction-based contract for the contract community was expanded to provide Government-wide D&B services for the grants and loans community. These services include parent linkage, help desk support, world database lookup, business validation and linkage monitoring, matching services, as well as the use of DUNS numbers. The enterprise D&B contract provides substantial savings to the participating agencies over their previous agency transaction-based D&B contracts.

On December 14, 2007, OMB launched <http://www.USASpending.gov> to meet the FFATA statutory requirements. Since the launch, OMB has and will continue to work with agencies to improve the quality, timeliness, and accuracy of their data submissions and has released a series of enhancements to the site. The USASpending.gov Web site complements others that provide the public with Federal program performance information (e.g., USA.gov, Results.gov, and ExpectMore.gov).

The USASpending.gov Web site provides:

- the name of the entity receiving the award;
- the amount of the award;
- information on the award including transaction type, funding agency, etc;
- the location of the entity receiving the award; and
- a unique identifier of the entity receiving the award.

In addition to routine enhancements to improve usability and maintainability, USASpending.gov is focused on supporting implementation of sub-contract and sub-grant awards reporting.

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All agencies participating in the posting and/or awarding of contracts, grants, and loans are required by the FFATA and ARRA reporting requirements to disclose award information on a publicly accessible Web site. Cross Government cooperation with OMB's IAE initiative allows agencies and contributing bureaus (including the bureaus at departments) to meet the requirements of the FFATA by assigning a unique identifier, determining corporate hierarchy, and validating and cleaning up incorrect or incomplete data. FFATA enhances transparency of Federal program performance information and funding.

The FY 2012 funding requirements, as it relates to the IAE loans and grants funding line, supports FFATA for the relationship with D&B and DUNS support services. In addition to provision of DUNS numbers, D&B is now providing business and linkage data seamlessly, and the business arrangement supports the quality of data by real-time updates. NASA and other agencies will leverage the linkages to corporate organizational rollups based on parental and subsidiary relationships.

LINE OF BUSINESS

Financial Management Lines of Business (LoB) FY 2012 Benefits (Managing Partners DOE and DOL)

The Financial Management Line of Business (FM LoB) leverages shared service solutions that improve the quality of Federal financial data and decrease known inefficiencies—and costs—that are typical of redundant financial management systems. FM LoB's Shared Services Providers (SSPs) offer participating agencies the economies of scale and expertise in IT and financial reporting not always available within a single agency. An emphasis is being placed on greater standardization, transparency, and business process improvements as opposed to solely technology improvements.

The FM LoB initiative uses standard business practices and meets Federal accounting standards for financial reporting. This level of standardization across all Federal agencies would provide executive decision makers with accurate information from which to assess program performance and risks, evaluate costs, and improve stewardship across the Federal Government.

Current OMB FM LoB policy requires agencies to conduct a competition among Federal and commercial SSPs before attempting to modernize financial systems. Commercial SSPs have not yet been designated to support the same range of services provided by Federal SSPs.

SSPs offer many benefits.

- Cost Avoidance:
 - Agencies using SSPs will not have to configure, operate and maintain individual financial systems, whether customized or commercial off-the-shelf;
 - Share common costs for standard application management and IT support functions; and
 - Minimize costs of testing and evaluation for upgrades.
- Facilitate Best Practices:
 - Agency SSP customers leverage IT and financial processing expertise to provide shared services to multiple agencies, boards, and commissions;
 - Consistent and reliable financial data can be shared across agency business systems;
 - Standardized, Government-wide financial codes and categorizations of financial transactions improve financial reporting and accountability;
 - Increased efficiency of financial transactions is achieved through reengineered and stream-lined business processes; and
 - Minimization of risks associated with financial system implementation by providing a uniform starting point for configuration

In October 2009, FM LoB released the standard business processes for reporting and reimbursable management. FM LoB is creating tools that will offer agencies a boilerplate solicitation template and guidelines for completing a request for proposals or system migrations. FM LoB is also incorporating public feedback to draft core financial system requirements. Once the requirements have been updated, the certified core accounting software products will be implemented with a federal configuration to help agencies upgrade their existing financial management software or migrate to an SSP.

NASA expressed an interest in becoming a SSP, but awaits OMB direction on the future direction of the FM LoB.

Human Resources Management LoB (Managing Partner OPM) FY 2012 Benefits

The HR LoB vision is to create Government-wide, modern, cost-effective, standardized, and interoperable HR solutions to provide common core functionality to support the strategic management of HR through the establishment of SSCs. Driven from a business perspective rather than a technology

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focus, the solutions will address distinct business improvements enhancing the Government's performance of HR and payroll services in support of agency missions delivering services to citizens. The HR LoB concept of operations calls for agencies to receive core services from an HR LoB provider. These core HR services are defined as personnel action processing, compensation management (payroll), and benefits management. Leveraging shared services solutions will allow the HR LoB to significantly improve HR and payroll service delivery, save taxpayer dollars, and reduce administrative burdens.

NASA works in partnership with one of the approved service providers, the Department of Interior's National Business Center (NBC). Through this partnership, NASA shares and receives "best-in-class" HR solutions. NBC delivers NASA-developed solutions to their customer agencies, enabling improved efficiencies and system integrations at a fraction of the cost and delivery time than similar solutions could have been produced by NBC. NASA achieves the benefits of these best-in-class HR solutions through implementation and integration of NBC and NASA-developed HR solutions. NASA's participation in HR LoB allows the Agency to participate in the implementation of modern HR solutions and benefit from best practices and Government-wide strategic HR management.

Grants Management LoB (Managing Partners HHS and NSF) FY 2012 Benefits

The Grants Management LoB (GM LoB) will ultimately offer the development of a Government-wide solution to support end-to-end grants management activities promoting citizen access, customer service, and financial and technical stewardship for the Agency. The end result is intended to be a Government-wide streamlined grant making process providing transparency and efficiency in the grant decision-making process. The benefits of GM LoB include increased service to citizens through standardized processes; cost savings for grant-making agencies through use of shared IT infrastructure; a reduction in the number of redundant grants management systems; and improved reporting on Government-wide grant activities and results. GM LoB adopted a "consortia-based" approach to implementation and developed a process for forming consortia and having agencies participate in consortia as members.

In FY 2007, NASA signed a Memorandum of Understanding with its selected consortia partner, the National Science Foundation (NSF). In 2008, NASA implemented NSF's new research-focused initiative, Research.gov, improving public access to detailed information about NASA research awards. Research.gov is a collaborative partnership of Federal research-oriented agencies working together for the ultimate benefit of the research community. The Research Spending and Results Service allows Congress, the general public, and the broader research community to easily search and find in one place the grant award information for NASA and NSF. For 2012 and beyond, NASA and NSF will continue to serve the research community and to provide access to information and services for both agencies in one location. NASA news and information is also now available in Research.gov's "Policy Library and Research Headlines" section. Moving forward, NASA will continue to collaborate with NSF to explore and implement future Research.gov service offerings based on NASA and research community needs.

Geospatial LoB (Managing Partner DOL) FY 2012 Benefits

The Geospatial LoB will better serve the agencies' missions and the Nation's interests developing a more strategic, coordinated, and leveraged approach to producing, maintaining, and using geospatial data and services across the Federal Government. Specific goals of the Geospatial LoB include establishing a collaborative governance mechanism, coordinating a Government-wide planning and investment strategy, and optimizing and standardizing geospatial data and services.

Contributing agencies and bureaus will receive value from the development of the LoB primarily through improved business performance and cost savings. Enhanced governance processes, improved business planning and investment strategies, and optimization and standardization of geospatial

Supporting Data: E-Gov Initiatives and Benefits

business data and services will produce the following results:

- Collaborative management of geospatial investments will be made more adaptable, proactive and inclusive;
- Enterprise business needs and agency core mission requirements will be identified, planned, budgeted, and exploited in a geospatial context;
- Long-term costs of geo-information delivery and access will be reduced while minimizing duplicative development efforts;
- Effective, yet less costly commercial off the shelf systems and contractual business support operations will replace legacy geospatial applications; and
- Business processes will be optimized and knowledge management capabilities will exist for locating geospatial data and obtaining services.

As a science agency, the work of NASA's science and mission professionals is inherently different from duties and functions performed by operational agencies. These differences lead NASA to organize and manage data to best facilitate science activities rather than a central focus of data dissemination. Scientific inquiry often leads scientist to use different schemas for analyzing data and information produced from remote sensing data (e.g. a common grid or projection). NASA will continue to apply the elements of Federal Geographic Data Committee standards where these are appropriate. In FY 2008, NASA signed an MOU with the Department of Labor to continue its active participation in the Geospatial LoB.

Budget Formulation & Execution LOB (Managing Partner Education) FY 2012 Benefits

The Budget Formulation and Execution LoB (BFELoB) provides benefits to NASA and other partner agencies by encouraging best practices crossing all aspects of Federal budgeting -- from budget formulation and execution to performance to human capital needs. To benefit all agencies, BFELoB continues to support the idea of shared service budget systems. As NASA currently has its own budgeting tools, the Agency has not chosen to move to a new budget system; however, NASA is looking into some of the BFELoB components, such as MAX Collect and Analytics, to complement its current budgeting tools.

BFELoB's "MAX Federal Community," a secure Government-only collaborative Web site, provides significant benefits for collaboration across and within agencies, as well as knowledge management. The Community site is commonly used for sharing information, collaboratively drafting documents (including the direct-editing of documents posted on the site), supporting workgroups, submitting central reports, and much more. NASA currently has well over 900 users that are registered and eligible to take advantage of the MAX Federal Community. During FY 2010 year-end planning, NASA made extensive use of the MAX Wiki capability to facilitate work group collaborations and document reviews.

The BFELoB released MAX Collect to facilitate the rapid collection and reporting of agency information. In November 2010, NASA successfully completed its first Agency-wide MAX Collect exercise. Among the benefits NASA realized by using MAX Collect's data collection capabilities were reduced errors, and reduced time spent manually consolidating and publishing data. NASA also benefited from using MAX Collect and its publishing capabilities to collect, store, process, and publish information from multiple sources in an extremely efficient and effective manner, producing professional quality output. To enhance future decision-making within its organization, NASA can benefit from using MAX Analytics' data visualization tools.

In October 2009, the Budgeting Capabilities Self Assessment Tool was published, providing agency budget managers and their staff with a simple survey-like method to assess and gain perspective on how their current operations and processes compare against best practices in a broad range of budgeting capability categories. This allows managers to strategically focus improvement efforts on

Supporting Data: E-Gov Initiatives and Benefits

areas of highest value to their particular organization's activities. NASA will explore use of this tool to assess organizational practices and develop strategic plans to address areas of need.

BFELoB's Human Capital Federal Budget Core Competency Framework is a resource for NASA to use in their internal workforce planning initiatives in 2011/2012. BFELoB is working toward adding proficiency levels to each core competency as well as aligning training with competencies and proficiencies to assist budget professionals in determining a training roadmap for development. During FY 2010, BFELoB released a self-paced budget formulation video training course to users of the MAX Community. In addition, the BFELoB human capital working group offers multiple technical and developmental training opportunities throughout the year. NASA staff have benefitted substantially from these BFELoB sponsored training opportunities, as well as through participation in BFELoB working groups.

National Aeronautics and Space Administration Proposed Appropriations Language

SCIENCE

For necessary expenses, not otherwise provided for, in the conduct and support of science research and development activities, including research, development, operations, support, and services; maintenance and repair, facility planning and design; space flight, spacecraft control, and communications activities; program management; personnel and related costs, including uniforms or allowances therefor, as authorized by 5 U.S.C. 5901-5902; travel expenses; purchase, lease, charter, maintenance, and operation of mission and administrative aircraft, \$5,016,800,000, to remain available until September 30, 2013.

AERONAUTICS

For necessary expenses, not otherwise provided for, in the conduct and support of aeronautics research and development activities, including research, development, operations, support, and services; maintenance and repair, facility planning and design; program management; personnel and related costs, including uniforms or allowances therefor, as authorized by 5 U.S.C. 5901-5902; travel expenses; purchase and hire of passenger motor vehicles; and purchase, lease, charter, maintenance, and operation of mission and administrative aircraft, \$569,400,000 to remain available until September 30, 2013.

SPACE TECHNOLOGY

For necessary expenses, not otherwise provided for, in the conduct and support of space research and technology development activities, including research, development, operations, support, and services; maintenance and repair, facility planning and design; space flight, spacecraft control, and communications activities; program management; personnel and related costs, including uniforms or allowances therefor, as authorized by 5 U.S.C. 5901-5902; travel expenses; purchase and hire of passenger motor vehicles; and purchase, lease, charter, maintenance, and operation of mission and administrative aircraft, \$1,024,200,000 to remain available until September 30, 2013.

EXPLORATION

For necessary expenses, not otherwise provided for, in the conduct and support of exploration research and development activities, including research, development, operations, support, and services; maintenance; construction of facilities including repair, rehabilitation, revitalization, and modification of facilities, construction of new facilities and additions to existing facilities, facility planning and design, and restoration, and acquisition or condemnation of real property, as authorized by law; space flight, spacecraft control, and communications activities; program management, personnel and related costs, including uniforms or allowances therefor, as authorized by 5 U.S.C. 5901-5902; travel expenses; purchase and hire of passenger motor vehicles; and purchase, lease, charter, maintenance, and operation of mission and administrative aircraft, \$3,948,700,000, to remain available until September 30, 2013: Provided, That when any activity has been initiated by the incurrence of obligations for construction of facilities or environmental compliance and restoration activities as authorized by law, such amount available for such activity shall remain available until September 30, 2017.

SPACE OPERATIONS

For necessary expenses, not otherwise provided for, in the conduct and support of space operations research and development activities, including research, development, operations, support, and services; maintenance; construction of facilities including repair, rehabilitation, revitalization, and modification of facilities, construction of new facilities and additions to existing facilities, facility planning and design, and restoration, and acquisition or condemnation of real property, as authorized by law; space flight, spacecraft control and communications activities; program management; personnel and related costs, including uniforms or allowances therefor, as authorized by 5 U.S.C. 5901–5902; travel expenses; purchase and hire of passenger motor vehicles; and purchase, lease, charter, maintenance and operation of mission and administrative aircraft, \$4,346,900,000, to remain available until September 30, 2013: Provided, That when any activity has been initiated by the incurrence of obligations for construction of facilities or environmental compliance and restoration activities as authorized by law, such amount available for such activity shall remain available until September 30, 2017.

EDUCATION

For necessary expenses, not otherwise provided for, in carrying out aerospace and aeronautical education research and development activities, including research, development, operations, support, and services; program management; personnel and related costs, uniforms or allowances therefor, as authorized by 5 U.S.C. 5901–5902; travel expenses; purchase and hire of passenger motor vehicles; and purchase, lease, charter, maintenance, and operation of mission and administrative aircraft, \$138,400,000, to remain available until September 30, 2013.

CROSS AGENCY SUPPORT

For necessary expenses, not otherwise provided for, in the conduct and support of science, aeronautics, exploration, space operations and education research and development activities, including research, development, operations, support, and services; maintenance and repair, facility planning and design; space flight, spacecraft control, and communications activities; program management; personnel and related costs, including uniforms or allowances therefor, as authorized by 5 U.S.C. 5901–5902; travel expenses; purchase and hire of passenger motor vehicles; not to exceed \$120,000 for official reception and representation expenses; and purchase, lease, charter, maintenance, and operation of mission and administrative aircraft, \$3,192,000,000, to remain available until September 30, 2013: Provided, That of the funds made available under this heading, \$3,600,000 is for strengthening the Agency's acquisition workforce capacity and capabilities: Provided further, That, with respect to the previous proviso, such funds shall be available for training, recruitment, retention, and hiring members of the acquisition workforce as defined by the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 401 et seq.): Provided further, That, with respect to the first proviso, such funds shall be available for information technology in support of acquisition workforce effectiveness or for management solutions to improve acquisition management.

CONSTRUCTION AND ENVIRONMENTAL COMPLIANCE AND RESTORATION

For necessary expenses for construction of facilities including repair, rehabilitation, revitalization, and modification of facilities, construction of new facilities and additions to existing facilities, facility planning and design, and restoration, and acquisition or condemnation of real property, as authorized by law, and environmental compliance and restoration, \$450,400,000, to remain available until September 30, 2017: Provided, That 51 U.S.C. 20145(b) is amended by inserting "(A)" immediately following "(1)" and adding at the end thereof the following new subparagraph (B) as follows: "(B) Notwithstanding subparagraph (A), the Administrator may accept in-kind consideration for leases entered into for the purpose of developing renewable energy production facilities."

OFFICE OF INSPECTOR GENERAL

For necessary expenses of the Office of Inspector General, in carrying out the Inspector General Act of 1978, \$37,500,000.

ADMINISTRATIVE PROVISIONS

Funds for announced prizes otherwise authorized shall remain available, without fiscal year limitation, until the prize is claimed or the offer is withdrawn.

Not to exceed 5 percent of any appropriation made available for the current fiscal year for the National Aeronautics and Space Administration in this Act may be transferred between such appropriations, but no such appropriation, except as otherwise specifically provided, shall be increased by more than 10 percent by any such transfers. Balances so transferred shall be merged and available for the same purposes and the same time period as the appropriations to which transferred. Any transfer pursuant to this provision shall be treated as a reprogramming of funds under section 505 of this Act and shall not be available for obligation except in compliance with the procedures set forth in that section.

The unexpired balances of previous accounts, for activities for which funds are provided under this Act, may be transferred to the new accounts established in this Act that provide such activity. Balances so transferred shall be merged with the funds in the newly established accounts, but shall be available under the same terms, conditions and period of time as previously appropriated.

Section 40902 of title 51, United States Code, is amended by adding at the end thereof: "(d) Availability of Funds—The interest accruing from the National Aeronautics and Space Administration Endeavor Teacher Fellowship Trust Fund principal shall be available in FY 2012 and hereafter for the purpose of the Endeavor Science Teacher Certificate Program."

Of funds provided under the heading "Science" in this Act, up to \$10,000,000, shall be available for a reimbursable agreement with the Department of Energy for the purpose of re-establishing facilities to produce fuel required for radioisotope thermoelectric generators to enable future missions.

Reference: Acronyms and Abbreviations

21st CSLC	21st Century Space Launch Complex	APS	Aerosol Polarimetry Sensor
AA	Associate Administrator	ARC	Ames Research Center
AAAC	Astronomy and Astrophysics Advisory Committee	ARMD	Aeronautics Research Mission Directorate
ACCESS	Advanced Collaborative Connections for Earth System Science	ARRA	American Recovery and Reinvestment Act
ACE	Advanced Composition Explorer	ASAP	Aerospace Safety Advisory Panel
ACRIMSat	Active Cavity Radiometer Irradiance Monitor Satellite	ASCENDS	Active Sensing of Carbon dioxide Emissions over Nights, Days and Seasons
ACS	Advanced Camera for Surveys (Hubble Space Telescope instrument)	ASEB	Aeronautics and Space Engineering Board of the National Academies
ADAP	Astrophysics Data Analysis Program	ASI	Agenzia Spaziale Italiana (Italian Space Agency)
ADCAR	Astrophysics Data Curation and Archival Research	ASP	Airspace Systems Program
ADS	Astrophysics Data System	ASPERA-3	Analyzer of Space Plasma and Energetic Atoms-3
AEMC	Advanced Environmental Monitoring and Control	ASM	Acquisition Strategy Meeting
AES	Advanced Exploration Systems	ASP	Acquisition Strategy Planning
AFOSR	Air Force Office of Scientific Research	ASRG	Advanced Stirling Radioisotope Generator
AFRL	Air Force Research Laboratory	ASTER	Advanced Spaceborne Thermal Emission Reflection Radiometer
AIM	Aeronomy of Ice in the Mesosphere	ATLO	Assembly, Test, Launch Operations
AIRS	Advanced Infrared Sounder	ATMS	Advanced Technology Microwave Sounder (NPOESS Preparatory Project instrument)
AITs	Agency Information Technology Services	ATP	Aeronautics Test Program
ALHAT	Autonomous Landing and Hazard Avoidance Technology	AURA	Association of Universities for Research in Astronomy
ALI	Advanced Land Imager	AuRA	Autonomous Robust Avionics
AMMOS	Advanced Multi-Mission Operations System	AVHRR	Advanced Very High Resolution Radiometer
AMO	Agency Management and Operations	AvSP	Aviation Safety Program
AMS	Alpha Magnetic Spectrometer	BAA	Broad Agency Announcement
AMSR-E	Advanced Microwave Scanning Radiometer for the Earth Observing System	BAE	British Aerospace
AMSU	Advanced Microwave Sounding Unit	BAH	Booz-Allen Hamilton
ANN. CR	Annualized Continuing Resolution	BARREL	Balloon Array for Radiation-belt Relativistic Electron Losses
APP	Annual Performance Plan	BATC	Ball Aerospace and Technology Corporation
APRET	Astrophysics Research and Enabling Technology Program (replaces APRA)	BHP	Behavioral Health and Performance
APG	Annual Performance Goal	BIM	Building Information Modeling
APL	Applied Physics Laboratory (Johns Hopkins University)	BIRA	Belgian Institute for Space Aeronomy
APPEL	Academy of Program/Project and Engineering Leadership	BWB	Blended Wing Body
APMC	Aeropropulsion Management Council	C/NOFS	Air Force Research Laboratory's Communication/Navigation Outage Forecast System
APMS	Aviation Performance Measuring System		
APRA	Astronomy and Physics Research and Analysis, replaced by APRET		

Reference: Acronyms and Abbreviations

C3S	Command, Control, and Communication Segment	COTS	Commercial Orbital Transportation Services
CALIPSO	Cloud–Aerosol Lidar and Infrared Pathfinder Satellite Observations	CRF	Capability Reliance Framework
CARA	California Association for Research in Astronomy	CRI	Center for Rotorcraft Innovation
CAS	Cross-Agency Support	CRS	Commercial Resupply Services
CAST	Commercial Aviation Safety Team	CrIS	Cross-track Infrared Sounder (NPOESS Preparatory Project instrument)
CC	Commercial Crew	CRYOSTAT	Cryogenic Propellant Storage And Transfer
CCDev	Commercial Crew Development	CSA	Canadian Space Agency
CCSP	Climate Change Science Program	CSBF	Columbia Scientific Balloon Facility
CDC	Centers for Disease Control	CSC	Computer Sciences Corporation
CDR	Climate Data Records	CSLE	Civil Service Labor and Expenses
CDR	Critical Design Review	CSTD	Crosscutting Space Technology Development
CDSSC	Canberra Deep Space Communications Complex	CTC	Chief Technologist Council
CECR	Construction and Environmental Compliance and Restoration	CY	Calendar Year
CERES	Clouds and the Earth's Radiant Energy System	CSPE	Colorimetric Solid Phase Extraction
CESR	Centre d'Etude Spatiale des Rayonnements Mars exploration	CVB	Constrained Vapor Bubble
CFD	Computational Fluid Dynamics	DAAC	Distributed Active Archive Centers
CFO	Chief Financial Officer	DAN	Dynamic Albedo of Neutrons
CheMin	Chemistry and Mineralogy Instrument (MSL)	DARPA	Defense Advanced Research Projects Agency
ChemCam	Chemistry Camera	dB	Decibel
CHS	Crew Health and Safety	DDT&E	Design, Development, Test, and Evaluation
CIF	Central Instrumentation Facility	DESDynI	Deformation, Ecosystem Structure, and Dynamics of Ice
CINDI	Coupled Ion Neutral Dynamics Investigation	DFRC	Dryden Flight Research Center
CIO	Chief Information Officer	DLR	Deutsches Zentrum für Luft- Raumfahrt (German Aerospace Center)
CJ	Congressional Justification (Budget)	DME	Development, Modernization, and Enhancement
CL	Confidence Level	DNA	Deoxyribonucleic Acid
CLARREO	Climate Absolute Radiance and Refractivity Observatory	DoD	Department of Defense
cm	Centimeter	DOE	Department of Energy
CMO	Center Management Operations	DOI	Department of Interior
CMS	Carbon Monitoring System	DORIS	Doppler Orbitography by Radiopositioning Integrated by Satellite (Ocean Surface Topography Mission instrument)
CNES	Centre Nationale D'Etudes Spatiale (French Space Agency)	DOT	Department of Transportation
CO2	Carbon Dioxide	DPMC	Directorate Program Mgmt Council
CoF	Construction of Facilities	DPR	Dual-frequency Precipitation Radar (Global Precipitation Measurement instrument)
CONAE	Argentina's National Committee of Space Activities	DR	Decommissioning Review
CoNNeCT	Communications, Navigation, and Networking reConfigurable Test Bed	DRS	Disturbance Reduction System

Reference: Acronyms and Abbreviations

DSI	Deutsches SOFIA Institut	ESS	Earth Science Subcommittee (of the NASA Advisory Committee)
DSN	Deep Space Network	ESSP	Earth System Science Pathfinder
DSS	Deep Space Station	ESTO	Earth Science Technology Office
DTN	Disruption Tolerant Networking	ESTP	Earth Science Technology Program
E/PO	Education and Public Outreach	ET	External Tank
ECA	An Ariane rocket	ETD	Exploration Technology Development
ECT	Energetic Particle, Composition and Thermal Plasma	ETDD	Enabling Technology Development and Demonstration
ED	Department of Education	ETM+	Enhanced Thematic Mapper Plus
ED	NASA Education	ETU	Engineering Test Unit
EDA	Efficient Descent Advisor	EUL	Enhanced Use Lease
EDL	Entry, Descent, and Landing	EUMETSAT	European Meteorological Satellite
EDLT	Entry, Descent and Landing Technologies	EV	Earth Venture
EDR	Environmental Data Record	EVA	Extravehicular Activity
EDT	Education Design Team	EX	Explorer Missions
EEE	Evolution of EOSDIS Elements	ExEP	Exoplanet Exploration Program
EELV	Evolved Expendable Launch Vehicle	EXES	Echelon-Cross-Echelle Spectrograph
EEO	Equal Employment Office	ExMC	Exploration Medical Capability
EFW	Electric Field and Waves Instrument	FAA	Federal Aviation Administration
ELC	ExPRESS Logistics Carrier	FAP	Fundamental Aeronautics Program
ELV	Expendable Launch Vehicle	FAR	Federal Acquisition Regulation
EM2	Electronics Box Engineering Model 2	FGM	Fluxgate Magnetometer (Thermal Emission Imaging System instrument)
EMFISIS	Electric and Magnetic Field Instrument Suite and Integrated Science	FGS	Fine Guidance Sensor
EMTGO	ExoMars Trace Gas Orbiter	FGS-TF	Fine Guidance Sensor - Tunable Filter
EO	Equal opportunity	FIFI LS	Field Imaging Far-Infrared Line Spectrometer
EO-1	Earth Observing One Mission	FLITECAM	First Light Infrared Test Experiment Camera
EONS	Education Opportunities in NASA STEM	FMI	Finnish Meteorological Institute
EOS	Earth Observing System	FO	Follow On (to a mission)
EOSDIS	Earth Observing System Data and Information System	FOC	Full Operational Capability
EPA	Environmental Protection Agency	FOIA	Freedom of Information Act
EPOXI	Extrasolar Planet Observation and Deep Impact Extended Investigation	FOR	Flight Operations Review
EPSCoR	Experimental Program to Stimulate Competitive Research	FORCAST	Faint Object InfrRed CAmera for the SOFIA Telescope
ERA	Environmentally Responsible Aviation	FPA	Focal Plane Array
ERD	Exploration Research and Development	FPD	Flight Projects Directorate
ESA	European Space Agency	FRR	Flight Readiness Review
ESD	Earth Science Division	FTE	Full Time Equivalency
ESDR	Earth System Data Records	FUV	Far Ultraviolet
ESM	Earth Systematic Missions	FY	Fiscal Year
ESMD	Exploration Systems Mission Directorate	GALEX	Galaxy Evolution Explorer
ESMP	Earth Systematic Missions Program	GAO	Government Accountability Office
		GCD	Game Changing Development

Reference: Acronyms and Abbreviations

GEMS	Gravity and Extreme Magnetism	HPIW	High Pressure Industrial Water
GEO	Geosynchronous Earth Orbit	HPPG	High Priority Performance Goal
GES DAAC	GSFC Earth Science Distributed Active Archive Center	HQ	NASA Headquarters
GeV	Gigaelectron volt	HRP	Human Research Program
GHz	Gigahertz	HSB	Humidity Sounder for Brazil
GLAST	Gamma-ray Large Area Space Telescope (now Fermi Gamma-ray Space Telescope)	HSFO	Human Space Flight Operations
GLOBE	Global Learning and Observations to Benefit the Environment	HSPD	Homeland Security Presidential Directive
GMI	GPM Microwave Imager (Global Precipitation Measurement instrument)	HST	Hubble Space Telescope
GOES	Geostationary Operational Environmental Satellite	HTV	H-II Transfer Vehicle
GPM	Global Precipitation Measurement	Hydros	Hydrosphere State Project
GPS	Global Positioning System	I&T	Integration and Test
GRACE	Gravity Recovery and Climate Experiment	I3P	Information Technology Infrastructure Integration Program
GRAIL	Gravity Recovery and Interior Laboratory	IASI	Infrared Atmospheric Sounding Interferometer
GRC	Glenn Research Center	IBEX	Interstellar Boundary Explorer
GRC-PBS	Glenn Research Center–Plum Brook Station	IBPD	Integrated Budget and Performance Document
GREAT	German Receiver for Astronomy at Terahertz	ICA	Innovative Concepts for Aviation
GRGT	Guam Remote Ground Terminal	ICESat	Ice, Cloud, and Land Elevation Satellite
GRIP	Genesis and Rapid Intensification Processes	ICEScape	SMD Earth
GSFC	Goddard Space Flight Center	ICRP	Independent Comprehensive Review Panel
GWAC	Government Wide Acquisition Contracts	IDPS	Interface Data Processing Segment
HAVT	Hypersonic Air-breathing Vehicle Technologies	IG	Inspector General
HAWC	High-resolution Airborne Wideband Camera	IKI	Institut Kosmitscheski Isledowani (Russian Space Institute)
HEC	Human Exploration Capability	ILN	International Lunar Network
HECC	High End Computing Columbia	INPE	Brazilian Institute for Space Research
HgCdTe	Mercury-Cadmium-Telluride (type of array used in many instruments)	INTA	Instituto Nacional de Técnica Aeroespacial
HHC	Health and Human Countermeasures	IPWG	Interagency Partnerships Working Group
HH&P	Human Health & Performance	IPAC	Infrared Processing and Analysis Center
HIPO	High-speed Imaging Photometer for Occultation	IPAO	Independent Program Assessment Office
HIRDLS	High Resolution Dynamic Limb Sounder	IPCC	International Panel on Climate Change
HIRES	High Resolution Echelle Spectrometer	IPO	Integrated Program Office
HIRS	High Resolution Infrared Radiation Sounder	IPP	Innovative Partnerships Program
HITL	Human-in-the-loop	IPWG	Interagency Partnerships Working Group
HLV	Heavy Lift Vehicle	IR	Infrared
		IRAC	Integrated Resilient Aircraft Controls
		IRIS	Interface Region Imaging Spectrograph
		IRR	Investigation Readiness Reviews
		IRSA	NASA/IPAC Infrared Science Archive
		IRT	Independent Review Team

Reference: Acronyms and Abbreviations

ISAS	Institute of Space and Astronautical Science	LADEE	Lunar Atmosphere and Dust Environment Explorer
ISP	In-Space Propulsion	LaRC	Langley Research Center
ISRO	Indian Space Research Organisation	LASER	Lunar Advanced Science and Exploration Research
ISRP	Integrated Systems Research Program	LASP	Laboratory for Atmospheric and Space Physics (University of Colorado, Boulder)
ISRU	In-Situ Resource Utilization	LBT	Large Binocular Telescope
ISS	International Space Station	LBTI	Large Binocular Telescope Interferometer
ISSMP	International Space Station Medical Program	LCAS	Low-Cost Access to Space
IT	Information Technology	LCC	Life Cycle Cost
IV&V	Independent Verification and Validation	LCCE	Life Cycle Cost Estimate
IXO	International X-ray Observatory	LDCM	Landsat Data Continuity Mission
JADE	Jovian Auroral Distributions Experiment	LDEX	Lunar Dust EXperiment
JAXA	Japan Aerospace Exploration Agency	LEED	Leadership in Energy and Environment Design
JCL	Joint Cost and Schedule Confidence Level	LEO	Low Earth Orbit
JDEM	Joint Dark Energy Mission	LH2	Liquid Hydrogen
JEDI	Jupiter Energetic particle Detector Instrument	LISA	Laser Interferometer Space Antenna
JHU	John Hopkins University	LL	Lincoln Laboratory
JHU-APL	Johns Hopkins University–Applied Physics Laboratory	LLC	Limited Liability Company
JOI	Jupiter Orbit Insertion	LLCD	Lunar Laser Communications Demonstration
JPDO	Joint Planning and Development Office	LM	Lockheed Martin
JPL	Jet Propulsion Laboratory	LoB	Lines of Business
JPSS	Joint Polar Satellite System	LOX	Liquid Oxygen
JSC	Johnson Space Center	LQP	Lunar Quest Program
JWST	James Webb Space Telescope	LRD	Launch Readiness Date
K	Kelvin (degrees)	LRO	Lunar Reconnaissance Orbiter
KaPR	Ka-band Precipitation Radar	LRR	Launch Readiness Review
KDP	Key Decision Point Review	LSP	Launch Services Program
KeV	Kiloelectron Volts	LTO	LTO NOx subsonic
KHz	Kilohertz	LV	Launch Vehicle
kG	Kilogram	LWS	Living with a Star
KI	Keck Interferometer	\$M	Million (of Dollars)
km	Kilometer	µm	Microns (micrometers)
KNMI	Royal Netherlands Meteorological Institute	m	Meter
KSA	Keck Single Aperture	M3	Moon Mineralogy Mapper
KSC	Kennedy Space Center	MA	Multiple Access
KuPR	Ku Precipitation Radar	MACPEX	Mid-latitude Airborne Cirrus Properties Experiment
kVAR	Kilovolt Ampere Reactive	MAV	Mars Ascent Vehicle
kW	Kilowatt	MAVEN	Mars Atmosphere and Volatile Evolution
L2	Second Sun-Earth Libration, or Lagrange Point	MCR	Mission Confirmation Review
L3	L-3 Communications Corporation		

Reference: Acronyms and Abbreviations

MD	Mission Directorate	NACA	National Advisory Committee on Aeronautics
MDR	Mission Design Review	NAR	Non-Advocacy Review
MEaSURES	Making Earth System data records for Use in Research Environments	NAS	National Airspace System
MEDLI	Mars Science Laboratory Entry, Descent, and Landing Instrument	NASA	National Aeronautics and Space Administration
MER	Mars Exploration Rovers	NASDA	National Space Development Agency of Japan
MESSENGER	Mercury Surface, Space Environment, Geochemistry and Ranging	NEBULA	NASA's Cloud Computing Platform
METI	Ministry of Economy Trade and Industry (Japan)	NEN	Near Earth Network
MeV	Mega electron Volts	NEO	Near-Earth Object
MEX	Mars Express	NEOO	Near-Earth Object Observations
mGal	milligallon	NES	NASA Explorer Schools
MIB	Mishap Investigation Board	NESC	NASA Engineering and Safety Center
MICINN	Spanish Space Agency	NETS	NASA Educational Technology Services
MIDEX	Medium-Class Explorer	NextGen	Next Generation Air Transportation System
MIRI	Mid-infrared Instrument (James Webb Space Telescope instrument)	NEXT	NASA Evolutionary Xenon Thruster
MIT	Massachusetts Institute of Technology	NExSci	NASA Exoplanet Science Institute
MK	megakelvin	NGAS	Northrup Grumman Aerospace Systems
MLS	Microwave Limb Sounder	NGO	Non-Governmental Organization
MMO	Mars Mission Operations	NGST	Northrop Grumman Space Technology
MMOD	Micrometeoroid/ Orbital Debris	NH	Northern Hemisphere
MMS	Magnetospheric Multiscale	NIAC	NASA Institute for Advanced Concepts
MO	Missions of Opportunity	NIH	National Institute for Health
MODIS	Moderate Resolution Imaging Spectroradiometer	NIR	Near-Infrared
MOE	Mission Operations Element	NIRCam	Near-Infrared Camera
MOPITT	Measurements of Pollution in the Troposphere	NIRSpec	Near-Infrared Spectrometer
MOU	Memorandum of Understanding	NISN	NASA Integrated Services Network
MPAR	Major Program Annual Report	NIVR	Netherlands Agency for Aerospace Programs
MPCV	Multi-Purpose Crew Vehicle	NLR	National Aerospace Laboratory of the Netherlands
MRO	Mars Reconnaissance Orbiter	NLS	NASA Launch Services
MRR	Mission Requirement Request	NLSI	NASA Lunar Science Institute
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>	nm	Nanometer
MSFC	Marshall Space Flight Center	NMSU	New Mexico State University
MSL	Mars Science Laboratory	NOAA	National Oceanic and Atmospheric Administration
MUREP	Minority University Research and Education Project	NOx	Nitrogen Oxide
MUSS	Multi-User Systems and Support	NPAT	National Partnership for Aeronautic Testing
MWR	Microwave Radiometer	NPD	NASA Policy Directive
N/A	Not applicable	NPO	Non-Profit Organization
NAC	NASA Advisory Committee	NPOESS	National Polar-orbiting Operational Environmental Satellite System

Reference: Acronyms and Abbreviations

NPP	NPOESS Preparatory Project	ONERA	Office National d'Études et de Recherches Aérospatiales
NPR	NASA Procedural Requirement	OPM	Office of Personnel Management
NRA	NASA Research Announcement	ORR	Operations Readiness Review
NRC	National Research Council	OSC	Orbital Sciences Corporation
NRCC	National Research Council Canada	OSCAT	Indian Space Agency's scatterometer instrument
NRL	Naval Research Laboratory	OSHA	Occupational and Safety and Health Administration
NRO	National Reconnaissance Office	OSMA	Office of Safety and Mission Assurance
NSBRI	National Space Biomedical Research Institute	OSP	Orbital/Suborbital Program (of the USAF)
NSC	NASA Safety Center	OSTP	Office of Science and Technology Policy
NSF	National Science Foundation	OSTST	Ocean Surface Topography Science Team
NSPD	National Space Policy Directive	OTE	Optical Telescope Element
NSSC	NASA Shared Services Center	OTIS	Optical Telescope Element/ Integrated Science Module (JWST)
NSSDC	National Space Science Data Center	OVWST	Ocean Vector Winds Science Team
NSWPC	National Space Weather Program Council	P.L.	Public Law
NTEC	NASA Technology Executive Council	PACE	Pre-Aerosols, Carbon and Ecosystems
NuSTAR	Nuclear Spectroscopic Telescope Array	PAR	Performance and Accountability Report
NUV	Near Ultraviolet	PAR	Program Acceptance Review
NWP	Numerical Weather Prediction	PARASOL	Polarization & Anisotropy of Reflectances for Atmospheric Sciences coupled with Observations from a Lidar
O2	Oxygen		
OA	Office of Audits	PART	Program Assessment Rating Tool
OCE	Office of the Chief Engineer	PB	President's Budget
OCFO	Office of Chief Financial Officer	PBR	President's Budget Request
OCHMO	Office of the Chief Health and Medical Officer	PBS	President's Budget Submit
OCIO	Office of Chief Information Officer	PCA	Program Commitment Agreement
OCO	Orbiting Carbon Observatory	PCAD	Propulsion Cryogenics Advanced Development
OCT	Office of the Chief Technologist	PCBs	Polychlorinated biphenyls
OHCM	Office of Human Capital Management	PCOS	Physics of the Cosmos
OI	Office of Investigations	PDR	Preliminary Design Review
OIG	Office of Inspector General	PDS	Planetary Data System
OIIR	Office of International and Interagency Relations	PI	Principal Investigator
OLI	Operational Land Imager (Landsat Data Continuity Mission instrument)	PICS	Partnerships, Innovation and Commercial Space
OLS	Operational Linescan System	PIP	Payload Interface Processor
OMB	Office of Management and Budget	PIR	Program Implementation Review
OMC	Operations Management Council	PLAR	Post Launch Assessment Review
OMEGA	Offshore Membrane Enclosures for Growing Algae	PLSS	Portable Life Support System
OMI	Ozone Monitoring Instrument	PMA	President's Management Agenda
OMPS	Ozone Mapping and Profiler Suite (NPOESS Preparatory Project instrument)	PMC	Program Management Council
		PNAR	Preliminary Non-Advocate Review

Reference: Acronyms and Abbreviations

PNT	Positioning, Navigation, and Timing	SA/SPaH	Sample Acquisition, Processing, and Handling (drill for MSL)
POWER	Protecting Our Workers and Ensuring Reemployment Presidential Initiative	SAA	Space Act Agreement
PPS	Precipitation Processing System	SAC-D	Satellite de Aplicaciones Cientificas—D (Argentina)
PR	Precipitation Radar	SADA	Solar Array Drive Assembly
PSBR	Proton Spectrometer Belt Research	SAGE	Stratospheric Aerosol and Gas Experiment
PSL	Propulsion Systems Laboratory	SALMON	Stand Alone Missions of Opportunity NRA
psu	practical salinity units	SAM	Sample Analysis of Mars (MSL)
QTR	Quarter	SAP	NASA's Core Financial System
QuickSCAT	Quick Scatterometer	SAR	Synthetic Aperture Radar
R&A	Research and Analysis	SAU	Strategic Airspace Usage
R&D	Research and Development	SBC	Single Board Computer
R2	Robonaut 2	SBIR	Small Business Innovative Research
RAP	Robotics Alliance Project	SBRS	Santa Barbara Remote Sensing (Division of Raytheon)
RBSP	Radiation Belt Storm Probes	SCADA	Supervisory Control and Data Acquisition
RBSPICE	Radiation Belt Science of Protons, Ions, Composition, and Electrons	SCaN	Space Communications and Navigation
RCT	Randomized controlled trials	SCAP	Shared Capability Assets Program
REMS	Rover Environmental Monitoring System	SCEM	"The Scientific Context for Exploration of the Moon," NRC Planetary Science report
RF	Radio Frequency	SCNS	Space Communications Network Services
RFI	Request for Information	SDO	Solar Dynamics Observatory
RFP	Request for Proposal	SeaWiFS	Sea-viewing Wide Field-of-view Sensor
RHESSI	Reuven Ramaty High Energy Solar Spectroscopic Imager	SE&I	System Engineering and Integration
RMP	Risk Mitigation Phase	SEMAA	Science Engineering Mathematics Aerospace Academy
ROSES	Research Opportunities in Space and Earth Science	SET	Space Environment Testbeds
RPS	Radioisotope Power System	SFCO	Space Flight Crew Operations
RTF	Return to Flight	SFS	Space and Flight Support
RPT	Rocket Propulsion Testing	SFW	Subsonic Fixed Wing
RR	Readiness Review	SH	Southern Hemisphere
RS	Russian Segment	SI	Strategic Integration
RSAS	Raytheon Space and Airborne Systems	SGLT	Space-to-Ground Link Terminals
RSDO	Rapid Spacecraft Development Office	SI	Science Instrument(s)
RSRB	Reusable Solid Rocket Booster	SIM	Space Interferometry Mission
RSRM	Reusable Solid Rocket Motor	SIR	System Integration Review
RTAX	A field programmable gate array on RSBP	SLS	Space Launch System
RTF	Return to Flight	SM-4	Servicing Mission—4 (Hubble)
RVT	Remote Visual Testing	SMAP	Soil Moisture Active/Passive
RTT	Research Transition Teams	SMD	Science Mission Directorate
S/A	Solar array	SMEX	Small Explorer
s/c	Spacecraft		
S&MA	Safety and Mission Assurance		
S, R and Q	Safety, Reliability, and Quality		
SA	Single Access		

Reference: Acronyms and Abbreviations

SN	Space Network	STTR	Small Business Technology Transfer Program
SNGG	Space Network Ground Segment Sustainment	SWIR	Short Wave Infrared
SNSB	Swedish National Space Board	SWOT	Surface Water and Ocean Topography
Sol	Summer of Innovation	SwRI	Southwest Research Institute
SMC/TEL	Space and Mission Command/Test and Evaluation Directorate	SXS	High-Resolution Soft X-Ray Spectrometer
SMD	Science Mission Directorate	TAT	Test Assessment Team (JWST)
SMEX	Small Explorer	TBD	To be determined
SOC	Security Operations Center	TDEM	Technology Development for Exoplanet Missions
SOC	Solar Orbiter Collaboration	TDRS	Tracking and Data Relay Satellite
SOFIA	Stratospheric Observatory for Infrared Astronomy	TDRSS	Tracking and Data Relay Satellite System
SOHO	Solar Heliospheric Observer	THEMIS	Time History of Events and Macroscale Interactions during Substorms
SOMD	Space Operations Mission Directorate	TIM	Total Irradiance Monitor (Glory instrument)
SORCE	Solar Radiation and Climate Experiment	TIMED	Thermosphere, Ionosphere, Mesosphere, Energetics and Dynamics
SOST	Subcommittee on Ocean Science and Technology	TIMS	Thermal Infrared Multispectral Scanner
SpaceX	Space Exploration and Technology	TIRS	Thermal Infrared Sensor
SPHERES	Synchronized Position Hold, Engage, Reorient, Experimental Satellites	TMI	TRMM Microwave Imager
SPOC	Space Program Operations Contract	TNO TPD	Netherlands Organization for Applied Scientific Research - Institute of Applied Physics
SPP	Solar Probe Plus	TOF	Time of Flight
SR	Senior Review	TPS	Thermal Protection System
SR	Space Radiation	T&R	Transition and Retirement
SRA	Slip Ring Assembly	TRL	Technology Readiness Level
SR&T	Supporting Research and Technology	TRMM	Tropical Rainfall Measuring Mission
SRB	Standing Review Board	TSDIS	TRMM Science Data and Information System
SRG	Stirling Radioisotope Generator	TT&C	Flight Tracking Telemetry and Command
SRR	System Requirement Review	TWINS	Two Wide-angle Imaging Neutral-atom Spectrometers
SRW	Subsonic Rotary Wing	U.S.C.	United States Code
SSC	Stennis Space Center	UAS	Uninhabited Air Systems
SSME	Space Shuttle Main Engines	UAV	Unmanned Aerial Vehicle
SSO	Swiss Space Agency	UCLA	University of California at Los Angeles
SSP	Space Shuttle Program	UKSA	United Kingdom Space Agency
SSS	Sea Surface Salinity	ULA	United Launch Alliance
ST	Space Technology	USA	United Space Alliance
ST7	Space Technology 7 mission	USAF	United States Air Force
STEM	Science, Technology, Engineering, and Mathematics (Education)	USAID	U.S. Agency for International Development
STEREO	Solar Terrestrial Relations Observatory	USDA	United States Department of Agriculture
STI	Scientific and Technical Information		
STRG	Space Technology Research Grants Program		
STS	Space Transportation System		
STScI	Space Telescope Science Institute		

Reference: Acronyms and Abbreviations

USE	Upper Stage Engine	VTT	VTT Technical Research Centre of Finland
USGCRP	U.S. Global Change Research Program	WFF	Wallops Flight Facility (NASA, managed by GSFC)
USGS	United States Geological Survey	WFIRST	Wide-Field Infrared Survey Telescope
USRA	Universities Space Research Association	WISE	Wide-field Infrared Survey Explorer
UTD	University of Texas at Dallas	WMAP	Wilkinson Microwave Anisotropy Probe
UV	Ultraviolet	WSC	White Sands Complex
UVS	UV Spectrometer	WSTF	White Sands Test Facility
VAO	Virtual Astronomical Observatory	XCVR	Transceiver
VCL	Vegetation Canopy Lidar	XMM	X-ray Multi-mirror Mission (Newton Observatory)
VIIRS	Visible-Infrared Imager Radiometer Suite (NPOESS Preparatory Project instrument)	XPI	X-ray Polarimeter Instrument